EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with G. Matthew McCloskey on September 18, 2009.

The application has been amended as follows:

IN THE CLAIMS:

Claim 1 (Currently Amended) A system for delivering a desired mass of gas, comprising: a chamber; a first valve controlling gas flow into the chamber; a second valve controlling gas flow out of the chamber; a pressure transducer providing measurements of pressure within the chamber; a controller connected to the valves and the pressure transducer, wherein the controller is configured and arranged to:

(i) receive a desired mass flow setpoint from an input device;

(ii) close the second valve;

(iii) open the first valve;

(iv) receive chamber pressure measurements from the pressure transducer;

(v) close the first valve when pressure within the chamber reaches a predetermined level;

(vi) wait a predetermined waiting period to allow the gas inside the chamber to approach a state of equilibrium;

(vii) open the second valve at time = t_o;

(viii) calculate a value of the total mass delivered when the second valve is open and as a function of temperature and pressure within the chamber; and

(ix) close the second valve at time = t^* when the calculated value of total mass delivered equals the desired mass flow setpoint, wherein t^* is from about 100 milliseconds to about 500 milliseconds wherein the mass delivered Δm at time t^*, is determined by the controller as:

$\Delta m = m(t_o) - m(t^*) = (V/R)[(P(t_o)/T(t_o)) - (P(t^*)/T(t^*))]$,

wherein $m(t_o)$ is the mass of the gas in the delivery chamber at time = t_o when the gas within the delivery chamber is at a state of equilibrium, $m(t^*)$ is the mass of the gas in the delivery chamber at time = t^*, V is the volume of the delivery chamber, R is equal to the ideal gas constant (J/ Kg-K), $P(t_o)$ is the pressure in the delivery chamber at time = to, $P(t^*)$ is the pressure in the deliver chamber at time = t^*, $T(t_o)$ is the temperature in the delivery chamber at time = to, $T(t^*)$ is the temperature in the delivery chamber at time = t^*.

Claim 2 (Cancelled)

3. (Currently Amended) A system according to claim [2]1, further comprising a temperature probe secured to the chamber and connected to the controller, wherein the temperature probe provides T(t0) and T(t*) to the controller.

Claim 21. (Currently Amended) A system for delivering a desired quantity of mass of gas, comprising: a chamber including an inlet and outlet; an inlet valve, connected to the inlet, configured and arranged so as to control the flow of gas into the chamber through the inlet; an outlet valve, connected to the outlet, configured and arranged so as to control the flow of gas from the chamber through the outlet; and a controller configured and arranged to control the inlet and outlet valves so that (a) gas can flow into the chamber until the pressure within the chamber

reaches a predetermined level, (b) the pressure of gas within the chamber can reach a state of equilibrium, and (c) a controlled amount of mass of the gas can then be measured when the outlet valve is open and allowed to flow from the chamber as a function of a setpoint corresponding to a desired mass, and the temperature and pressure in the chamber, wherein for delivery of the mass of gas, the outlet valve is open for a time of about 100 milliseconds to about 500 milliseconds, wherein the amount of mass of gas flowing from the chamber, Δm at time t^*, is determined by the controller as follows:

$\Delta m = m(t_o) - m(t^*) = (V/R)[(P(t_o)/T(t_o)) - (P(t^*)/T(t^*))]$,

wherein $m(t_o)$ is the mass of the gas in the delivery chamber at time = t_o when the gas within the delivery chamber is at a state of equilibrium, $m(t^*)$ is the mass of the gas in the delivery chamber at time = t^*, V is the volume of the delivery chamber, R is equal to the ideal gas constant (J/ Kg-K), $P(t_o)$ is the pressure in the delivery chamber at time = to, $P(t^*)$ is the pressure in the deliver chamber at time = t^*, $T(t_o)$ is the temperature in the delivery chamber at time = to, $T(t^*)$ is the temperature in the delivery chamber at time = t^*.

Claim 23 (Cancelled)

Allowable Subject Matter

2. Claims 1,3-12,21,22 and 24-30 are allowed.

3. The following is a statement of reasons for the indication of allowable subject matter: The closest prior art to the claimed invention is to Wilmer (USPat. 5865205), Carpenter; Craig M. et al. (US 7335396 B2), and Ohmi (USPat. 6193212). Independent claim 1 and 21 require that the claimed controller perform the claimed calculation Δm "when the outlet valve is open" and "the outlet valve is open for a time of about 100 milliseconds to about 500 milliseconds".

Wilmer was described in the prosecution history as *not teaching* such a valve operation by Wilmer's controller (301; Figure 3A,B). Further, although similar to Nawata (US 20040244837 A1), Nawata and none of the cited references teach or suggest a controller applying the claimed Δm calculation as independently claimed. Likewise, Carpenter, although teaching a controlled inlet (176; Figure 5) and outlet (176; Figure 5) and similar valve operation (column 7; lines 25-35), Carpenter does not teach or suggest the claimed calculation Δm "when the outlet valve is open" and close the outlet valve "when the calculated quantity of gaseous mass reaches a mass setpoint".

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

US 20070039549 A1

US 20060130744 A1

US 20050249876 A1

US 20050223979 A1

US 20050199342 A1

US 20050160983 A1

US 20050126483 A1

US 20050081786 A1

US 20040226507 A1

US 20040015300 A1

US 20030180458 A1

US 20030094136 A1

US 20020195145 A1

US 20020098627 A1

US 20020094681 A1

US 20020007790 A1

US 7474968 B2

US 7434477 B2

US 7428373 B2

US 7335396 B2

US 7216019 B2

US 7094614 B2

US 7089134 B2

US 7050708 B2

US 6958277 B2

US 6913031 B2

US 6911092 B2

US 6820632 B2

US 6782348 B2

US 6673323 B1

US 6631334 B2

US 6612331 B2

US 6125869 A

US 6119710 A

US 6062256 A

US 5868159 A

US 5849092 A

US 5565038 A

US 5500256 A

US 5394755 A

US 5281274 A

US 5225366 A

US 4911101 A

US 4783343 A

US 4717596 A

US 4640221 A

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (571) 272- 1442. The examiner can normally be reached on a Monday through Friday schedule from 9am through 5pm. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (571) 272-1700. If the examiner can not be reached please contact the examiner's supervisor, Parviz Hassanzadeh, at (571) 272- 1435

/Rudy Zervigon/

Primary Examiner, Art Unit 1792